

**SOME OBSERVATIONS AND RECOMMENDATIONS
FOR THOSE PLANNING FOR AND RESPONDING TO
ENVIRONMENTAL CHALLENGES PRESENTED
BY MAJOR DISASTERS**

Prepared by
Louisiana Department of Environmental Quality



**Based On Agency Experiences In Emergency Response, Cleanup,
And Recovery Efforts Following Hurricanes Katrina And Rita.**

Prepared for
U.S. Senate Committee on Environment and Public Works

Prepared in response to Senator Johnny Isakson's request made at the
**Senate Committee On Environment And Public Works Full Committee Field Hearing
On Moving Forward After Hurricanes Katrina And Rita**

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LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

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1.0 INTRODUCTION

On February 26, 2007, Louisiana Department of Environmental Quality (LDEQ) Secretary Dr. Mike McDaniel testified before the U.S. Senate Committee on Environment and Public Works at its Field Hearing on Moving Forward after Hurricanes Katrina and Rita. Dr. McDaniel's testimony focused on debris management and landfill issues associated with cleanup and recovery from the storms. His oral and written testimony along with supporting exhibits were submitted for the hearing record and may be accessed through the Committee or LDEQ's website at <http://www.deq.louisiana.gov/portal/>.

In his testimony, Dr. McDaniel suggested that the Committee consider the development of a "playbook" or guidance document for those having to deal with environmental issues arising from major disasters. This document would capture and build on lessons learned during the Katrina and Rita disasters and provide valuable guidance for those having to contend with major disasters in the future.

During the course of discussions following Dr. McDaniel's testimony, Senator Johnny Isakson referred to Dr. McDaniel's suggestion of a federal playbook and requested that he submit to the Committee his recommendations and advice to help others responding to future catastrophes. This document responds to that request. It represents the input from the Department's Executive Staff, who have been on the front lines in responding to the environmental challenges brought by Hurricanes Katrina and Rita. It is obviously presented from the perspective of LDEQ's experience in response and recovery efforts following the storms. However, we feel many of the observations and recommendations we provide would be applicable to environmental challenges brought by almost any major disaster.

We thank Senator Isakson and the Committee for presenting us with the opportunity to submit this document and trust that it stimulates discussions and actions that will be helpful to those responding to the next major disaster.

2.0 BACKGROUND

On August 29, 2005, Hurricane Katrina struck southeast Louisiana causing widespread damage to coastal areas of Louisiana, Mississippi, and Alabama. Less than a month later on September 24, 2005, Hurricane Rita struck southwest Louisiana, causing widespread damage along the Louisiana and Texas coasts and causing further damage within a number of the same parishes devastated earlier by Hurricane Katrina, notably the City of New Orleans, and Jefferson, Plaquemines, St. Bernard, and St. Tammany Parishes. Each of these powerful hurricanes individually presented disasters of historic proportions. In addition to the damage caused by wind, rain, and storm surges brought by these two storms, the overtopping and failure of levees and floodwalls caused by Hurricane Katrina resulted in a rapid flooding of over 80 percent of the metropolitan New Orleans area. The combination of hurricane impacts and flooding of the New Orleans area represented an unprecedented natural disaster for Louisiana and its coastal neighbors as well as the nation.

LDEQ's responsibilities under Louisiana's Emergency Operations Plan are limited primarily to Environmental Support Function 10 – Oil Spill, Hazardous Materials and Radiation. However, the Department responded to a broad range of needs immediately following the storms including:

- **Search and rescue**
- **Reconnaissance, damage and environmental threats assessment**
- **Environmental sampling and assessment**
- **Hazardous and radioactive materials management**
- **Recovery and environmental regulatory assistance**

And, of course

- **Debris Management** – In Louisiana alone, Hurricanes Katrina and Rita left in their wake over 62 million cubic yards of debris. In addition to vegetative debris and demolished structures, there were approximately 150,000 flood damaged homes, 350,000 abandoned vehicles, and 60,000 abandoned vessels to be dealt with.

In accordance with national emergency response plans, the U.S. Army Corps of Engineers (Corps) was assigned responsibility for the management of debris from Hurricanes Katrina and Rita. Although LDEQ has no directly assigned responsibilities for debris management under the state's Emergency Operating Plan, we do have statutory responsibilities for the regulation of solid waste and protection of the environment. From the onset, we have worked with the Corps, providing technical and regulatory assistance for their debris mission activities. Perhaps our most important roles have included working in conjunction with local governments to identify and approve sites for debris management and to provide oversight to see that debris is handled and disposed of in an expeditious and environmentally sound manner.

3.0 ORGANIZATION OF RESPONSE

We have organized this document in a manner similar to After Action Reports prepared by various agencies to review their performance in response to the hurricanes and to plan for future disasters. We provide observations (lessons learned) based on our experience of (1) what went well, (2) what didn't go well and needs to be improved, and (3) recommendations we feel would be helpful to those having to deal with environmental emergencies following future disasters.

4.0 WHAT WORKED WELL

4.1 Unified Command Center/Incident Management Team

Immediately following Katrina's landfall, an Incident Management Team (IMT) began assembling at LDEQ's headquarters in the Galvez building in downtown Baton Rouge. A Unified Command Center (UCC) was established to house and support the IMT.

Working from the UCC were LDEQ, representatives from the U.S. Environmental Protection Agency (EPA), U.S. Coast Guard (USCG), U.S. Army Corps of Engineers (Corps), National Oceanographic and Atmospheric Agency (NOAA), U.S. Geological Survey (USGS), Louisiana Oil Spill Coordinator's Office (LOSCO), Louisiana Department of Health and Hospitals (LDHH), Texas Commission on Environmental Quality (TCEQ) and local governments. As the post-storm situation stabilized and facilities and supporting infrastructure became available, the UCC was moved to New Orleans for obvious logistical advantages.

A similar IMT and UCC was established at LDEQ's southwest regional office in Lake Charles following Hurricane Rita.

The Unified Command Center and Incident Management Team collaboration and coordination worked exceedingly well for those local, state, and federal agencies dealing with the environmental issues following the storms. It was an efficient and effective means to address issues overlapping multiple jurisdictions.

Given the challenges faced by LDEQ, we were especially appreciative of good working relationships with EPA Region 6 and the local Corps debris management staff.

4.2 Emergency Management Assistance Compact (EMAC)

Ratified by Congress and passed into law in 1996, the Emergency Management Assistance Compact (EMAC) is an interstate mutual aid agreement that provides a mechanism for sharing personnel, resources, equipment and assets among states during emergencies and disasters.

Immediately following Hurricane Katrina, TCEQ graciously offered the services of about 20 members of its Strike Teams. The formal securing of this support was accomplished through the EMAC process. These individuals were well trained and equipped, blended immediately into the IMT emergency response field teams, and provided valuable assistance in the early storm response efforts. They departed back to Texas in advance of Hurricane Rita. Later, the Arkansas Department of Environmental Quality provided some of their staff to support the IMT emergency response efforts.

4.3 Employment of Remote Sensing Technologies for Reconnaissance and Damage and Threat Assessment

Aside from search and rescue, the first immediate need for environmental emergency response following a major disaster is to conduct reconnaissance and damage and threat assessment to guide response efforts. Areas of immediate concern to LDEQ, EPA, USCG, LOSCO, and other IMT partners included oil spills, ruptured pipelines, industrial facilities, rail cars, barges, water treatment facilities, wastewater treatment plants, radioactive materials, and NPL (superfund) sites.

We were fortunate to have made available to us a variety of remote sensing assets that served as a force multiplier, allowing reconnaissance of vast areas with a relatively small investment of personnel. Satellite imagery provided shortly following the storms allowed observations of environmental conditions and damage over broad areas and was invaluable in guiding

access and logistics for reconnaissance and damage and threat assessment in the flooded areas of metro New Orleans. High resolution aerial photography (also provided shortly following the hurricanes) allowed us to take detailed looks at individual industrial facilities, rail cars, barges, wastewater treatment facilities, pipeline breaks, and oil and fuel spills as well as at access points for sampling. EPA Region 6 sent over its ASPECT aircraft with air sampling, remote sensing, aerial photography, and geographical positioning capabilities. At LDEQ's request, EPA Region 6 also helped contract, on an emergency basis, a helicopter-mounted HAWK camera system. The HAWK camera is an infrared sensing technology that can image emissions of volatile organic compounds that are invisible to the naked eye. This capability was invaluable for remotely inspecting rail cars and barges for leaks, helping spot broken gas lines, fuel spills, and leaking product storage vessels at industrial facilities.

After LDEQ identified all locations of facilities holding radioactive materials licenses and requested security for those of special concern, the U.S. Department of Energy provided overflights of the storm damaged areas with high sensitivity radiation detectors. These overflights provided assurance that we had no loose radioactive sources of significance in the areas investigated.

4.4 Communications Reference

To facilitate both internal and external communications during the emergency response activities, LDEQ prepared a communications reference that listed points of contact and communications information for the various areas of agency activities. This was distributed widely to our IMT partners and to outside interests through e-mail and web site postings. We received considerable positive feedback, particularly from the private sector, for providing this means of facilitating communication with the agency in the early days following the storms.

4.5 Emergency Declarations and Orders

On Sunday, August 28, 2005, LDEQ Secretary McDaniel convened a special meeting of his staff to discuss preparations in advance of Hurricane Katrina. One of the outcomes of that meeting was a Declaration of Emergency and Administrative Order (emergency order), which the Secretary signed on August 30, 2005 to address the emergency conditions and measures deemed necessary in the wake of Hurricane Katrina to prevent irreparable damage to the environment and serious threat to life or safety throughout the designated emergency areas. Considering post-landfall conditions, a nearly identical emergency order was issued on September 27, 2005 in response to Hurricane Rita.

These emergency orders have been revised and reissued every sixty days based on additional information and changing conditions; they are still in effect in the most severely affected areas. Each order contained certain measures specifically authorized by LDEQ and determined necessary to respond to the emergency. Exhibits 1 and 2 in Dr. McDaniel's written testimony contained the latest two versions of the Hurricane Katrina emergency order at the time he testified; the Hurricane Rita orders are very similar.

LDEQ has a duty under the Louisiana Constitution to strike an appropriate balance between protection of the environment and economic, social, and other factors, consistent with the health, safety, and welfare of the people. The emergency orders have been an important part of LDEQ's fulfillment of that duty in the aftermath of Hurricanes Katrina and Rita. LDEQ's goal and expectation has been that the emergency orders would provide the information and regulatory flexibility to allow debris management and other recovery-related activities to occur as quickly as possible and in an environmentally sound manner.

Purpose of emergency orders

The emergency orders serve the dual purposes of:

- providing regulatory flexibility essential to the hurricane recovery efforts, as allowed under the Louisiana Environmental Quality Act (see, e.g., La. R. S. 30:2033), and
- providing useful information to the public about Louisiana's environmental laws and regulations.

Regulatory flexibility

The regulatory flexibility provided by the emergency orders consisted primarily of the temporary streamlining of procedural requirements for activities in the defined Emergency Areas, in order to expedite the restoration of important services and the removal of the enormous volume of hurricane debris. The emergency orders did not allow any activity that would endanger human health or the environment, and the orders had very little effect on substantive requirements, such as the limitations on effluent discharges to waters of the state. The orders generally required such standards as would a permit but did not require the time associated with the administrative process of obtaining a permit.

It was immediately necessary to provide regulatory flexibility to allow water discharges for necessary services and activities, such as potable water treatment, sanitary discharges where systems had been damaged, temporary housing locations, and temporary gasoline dispensing locations. The affected public needed safe drinking water, functioning sanitary facilities, and adequate shelter. Fuel was needed for first responders in the first days and weeks; fuel was also needed by the public, e.g., to operate generators on a continuing basis during widespread power outages. Regulatory flexibility was provided by managing such discharges in a manner protective of human health and the environment.

4.6 Environmental Sampling and Analysis

The potential for spills/releases of unsanitary wastes and hazardous materials during the storms and subsequent flooding prompted a concern for safety of the storm victims and emergency workers moving about in the floodwaters. An extensive environmental sampling program was commenced immediately by LDEQ, EPA, and partner agencies to determine potential risks associated with the contact of flood waters. This sampling effort was extended to basically all environmental media to address public concerns and was continued for well over a year following the storms.

This environmental sampling and analysis effort was probably among the largest and most intensive environmental characterizations ever undertaken. LDEQ along with EPA and other partner agencies collected thousands of environmental samples including floodwaters, Lake Pontchartrain and surrounding coastal areas, Mississippi River, sediment and soils, seafood, and air quality. Over a million individual analyses were performed.

Analytical results were compared to conservative health-based screening levels developed by EPA and LDEQ. Summaries and general assessments of the data were developed by EPA and LDEQ with input from the Centers for Disease Control (CDC), the Agency for Toxic Substances and Disease Registry (ATSDR), the Louisiana Department of Health and Hospitals (LDHH), and FEMA. The data and health risk assessments were presented to the public on EPA and LDEQ websites, through written reports, and at public meetings.

A more detailed description of the environmental sampling program can be found in our written testimony, and data gathered during the effort can be found on LDEQ and EPA websites.

4.7 Debris Management

Following landfall of Hurricane Katrina, LDEQ joined forces with other federal, state, and local agencies for the purpose of orchestrating and implementing a plan for the management of the then estimated more than 55 million cubic yards of debris. Designated as “Debris Operations”, these agencies met daily, sometimes meeting two or three times a day as subcommittees, to address planning needs, actual and potential legal issues, agency authority and resources, and to organize which agencies would be responsible for particular tasks in the overall mission. For example, one of the subcommittees was charged with the development of a checklist and/or flow diagram to be used as a tool by state and local government entities to assist them in making a decision on the condemnation and demolition of public and private buildings and residences.

It was clear that the debris mission’s scope would require the expertise and resources of numerous agencies to handle the amount of hurricane debris in an efficient and environmentally sound manner. The following agencies worked in collaboration to identify the debris management mission; develop the process to authorize debris management sites; and provide guidance to local government, clean up contractors, and the public:

- City of New Orleans
- St. Bernard Parish
- Governor’s Office of Homeland Security and Emergency Preparedness (GOHSEP)
- LDEQ
- Louisiana Department of Transportation and Development (LDOTD)
- Louisiana Department of Agriculture and Forestry (LDAF)
- Louisiana Department of Wildlife and Fisheries (LDWF)
- Center for Disease Control (CDC)
- EPA and its contractors

- U.S. Federal Emergency Management Agency (Congressional, Debris, Office of General Counsel, Safety, Infrastructure)
- Corps and its contractors: Phillips and Jordan, ECC, and CERES Environmental
- U.S. Coast Guard
- U.S. Department of Agriculture
- National Disaster Medical Service/ Disaster Mortuary
- U.S. Natural Resources Conservation Service (USDA-NRCS)
- U.S. Department of Homeland Security, Office of Inspector General, Office of Audits

Debris Management Plan

The intent of the debris management plan, developed by the debris mission task force, was:

[T]o formalize a process that will enable the State of Louisiana, [the Corps], and [FEMA] to comprehensively manage funding for large scale and complex debris clearances. The plan was also to address the responsibilities of the various Federal, State and local governmental agencies to control the removal and disposal project for the designated parishes.

The purpose of the plan was to furnish local governments with basic information on hurricane debris management within the scope of effective environmental management. Local governments were understandably unable to use normal non-emergency resources and processes to manage the unprecedented amount of hurricane debris. The plan was also designed to ensure that debris management projects met requirements of the Stafford Act, its regulations, and all applicable environmental laws; assist the state and parishes with contracting and contract monitoring as necessary; and to the extent possible, avoid eligibility, contractual, and environmental problems.

The group recognized that the plan should be considered a starting point, with recommendations for a regional disaster debris management plan requiring the approval of all government agencies before the final plan could be implemented.

With input from its debris task force partners, LDEQ prepared the Hurricane Katrina Debris Management Plan which was released on September 28, 2005, and revised on October 14, 2005. These earlier plans and lessons learned have been incorporated into LDEQ's Comprehensive Plan for Disaster Cleanup and Debris Management released July 2006 pursuant to Act 662 of the 2006 Louisiana Regular Legislative Session (and revised August 2006). A copy of this plan is contained in Dr. McDaniel's written testimony. An integral part of these plans is the segregation of debris so that the various types of debris can be properly managed and disposed. Segregation of debris occurs at multiple points in the debris handling process and Federal and State oversight has also been implemented at various points in the process to further insure proper disposal.

4.8 Hazardous Materials Management

With valuable assistance and resources provided by EPA, over 22.4 million pounds of hazardous materials (including household hazardous wastes) were collected and removed from waste streams for proper treatment and disposal. Over 4 million orphan containers – many containing hazardous materials – were collected and processed for recycling or disposal. Over 110 school laboratories were cleared of hazardous materials.

4.9 Recycling

The cleanup and management of storm-generated debris by the Debris Management Team presented one of the largest recycling efforts ever undertaken. Almost 100 percent of all green waste was ground for mulch or used for fuel. Collected and recycled were over 1 million white goods (e.g. refrigerators, freezers), almost 1 million electronic goods, and about a quarter of a million small engines. It is estimated that over 200,000 vehicles and 50,000 vessels damaged and abandoned following the storms will ultimately be scrapped and recycled. In all, it has been estimated that 37 percent of all storm generated debris has been recycled.

4.10 Joint Environmental Assessment Report

In response to public concern raised by inaccurate and misleading information and sensationalized media coverage concerning environmental conditions in the flooded portions of New Orleans, a joint environmental assessment was prepared by LDEQ, EPA, CDC, ASTDR, Corps, LDHH, FEMA, and others. The assessment report was released in December, 2005, at a news conference led by USCG Vice Admiral Thad Allen, Principal Federal Official for the Hurricane Katrina response. That a consensus of all these agencies on the assessment of environmental risk was achieved was an accomplishment in itself. Importantly, the credibility of the shoulder-to-shoulder presentation of the assessment by these combined agencies helped alleviate some of public concern about the safety of returning to New Orleans. Similarly, later reports were also issued as new data became available. A copy of the environmental assessment document is contained in the exhibits supporting our written testimony.

4.11 Documentation of Activities

The UCC/IMT efforts for environmental emergencies response and recovery were especially well-documented and offer an excellent record for those wishing to research, review, and learn from those efforts. Documentation includes: daily activity plans, sampling plans, standard operating procedures, analytical procedures, Corps Situation Reports (SitReps), EPA weekly activity reports, sampling and analysis data, decision records, written reports, presentations, extensive photographic documentation, communications records, testimony prepared for the Louisiana Legislature and the U.S. Congress, internet postings, and many other records. LDEQ has attempted to capture all related records available to the agency and compile them in a central records management repository.

5.0 WHAT DIDN'T WORK WELL AND NEEDS IMPROVEMENT

5.1 Search and Rescue

LDEQ boat crews help rescue almost 500 individuals from the New Orleans floodwaters. This was just a small part of a scrambling, heroic effort by the U.S. Coast Guard, Louisiana Department of Wildlife and Fisheries, Louisiana National Guard, and many other state and federal agencies and private citizens. As has been well-documented by after-action reviews, the search and rescue effort was hampered by inadequate preparations, limited resources, poor coordination, impaired communications, and the overwhelming circumstances of the disaster. Many lessons were learned during this effort and are being incorporated into planning for future disasters by the U.S. Department of Homeland Security, FEMA, our Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), and other affected government entities (federal, state, and local) as well as non-governmental agencies (NGAs, e.g. Red Cross) and private enterprises.

5.2 Communications

As has been well documented in the numerous after action reviews, communications capabilities for all responders were severely deficient immediately following the storms. Due to the gravity of this problem, it is believed that the communication vulnerabilities and interoperability issues are being addressed at all levels of government. As part of after action review and emergency planning for last hurricane season, LDEQ's Undersecretary was directed to assure that the agency acquire the communications capabilities to effectively respond to the next disaster.

5.3 Identification of Locations of Bulk Carriers of Large Quantities of Hazardous Materials.

Hurricanes Katrina and Rita scattered and damaged rail cars, barges, and other types of bulk carriers. Following Hurricane Katrina, LDEQ personnel worked exhaustively for over two weeks contacting shippers and conducting aerial and ground reconnaissance to try to identify and locate bulk transport containers of large quantities of hazardous materials. We were presented with stories of missing rail cars containing phosgene gas and rail cars containing corrosive materials that would eventually compromise the integrity of the containers and be released into the environment. We were fortunate that releases of hazardous materials from transport carriers were minimal. After our experience following Hurricane Katrina, we proactively began our collection of information on bulk containers of hazardous materials from shippers in advance of Hurricane Rita.

5.4 Alarmist Statements

Responding to inaccurate, misleading, and exaggerated statements/articles concerning environmental conditions following the storms consumed an inordinate amount of LDEQ's technical and communication resources as well as those of partner agencies. Reports of toxic

soup, toxic sludge, toxic dust, the killing of Lake Pontchartrain, and other alleged environmental impacts of Hurricane Katrina have been effectively refuted by scientists from state and federal environmental and public health agencies drawing on the extensive collection of sound environmental data. However, scaremongering by some individuals and organizations has unfairly stigmatized the New Orleans region and created unnecessary anxiety for those interested in returning to or visiting the region.

5.5 FEMA Blurring Debris Management Responsibilities

FEMA, EPA, LDEQ, and the Corps were all members of the debris mission task force, as noted previously in the Debris Mission Task Force section. LDEQ expected that agencies would implement their portion(s) of the debris management plan or other response and recovery activities, and that deference in environmental matters would be given to environmental agencies. As a result, LDEQ did not expect that FEMA would independently attempt to reevaluate receipt of hurricane debris at Gentilly Landfill, after the EPA and LDEQ had approved that site for receipt of such debris. EPA and LDEQ were the debris mission partners with responsibility for environmental considerations and compliance at hurricane debris disposal sites, and LDEQ had approved the site operation plan, with EPA's concurrence.

This unexpected insertion by FEMA into a smoothly running collaborative process caused direct, foreseeable impacts, not least of which was the need for both LDEQ and EPA to commit resources to addressing the various levels of concern expressed by the public, media, regulated community, and government that understandably arose.

One example of the detrimental consequences of violating this principle occurred with regard to the approved use of Gentilly Landfill to receive hurricane-related construction and demolition (C&D) debris. LDEQ issued a standard permit to Gentilly Landfill on December 28, 2004. LDEQ then issued an emergency authorization to the facility to start receiving hurricane related C&D debris on September 29, 2005. Shortly thereafter, the Corps began sending a substantial amount of C&D debris to this facility.

At FEMA's request, EPA performed an investigation and analysis concerning the potential federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability for use of the Gentilly Landfill and issued a memorandum November 11, 2005. In EPA's opinion, the use of this facility to receive hurricane related C&D waste would impose no CERCLA liability on FEMA. The memo offered "recommendations for current usage of the landfill to avoid a release of hazardous substances that would necessitate a superfund response." EPA's findings and conclusions were consistent with the prior study performed by the licensed engineering firm of EE&G, the Corps' subcontractor.

Without discussion or consultation with or notice to its debris mission partners LDEQ and EPA, FEMA commissioned a study by National Infrastructure Support Technical Assistance Consultants (NISTAC) to examine the potential impact by the Gentilly Landfill on the environment due to its use as a C&D landfill to receive hurricane related C&D debris. NISTAC's draft report concluded that FEMA could be exposed to high risk of future

environmental liability based on current conditions and environmental history of the Gentilly Landfill site.

Time and effort were required by both LDEQ and EPA, first to review, then to consult together, and finally to refute the findings of the draft NISTAC report that had been prematurely released. To respond to the report, LDEQ ultimately had to develop and issue a press release to refute claims in the NISTAC draft report concerning Gentilly Landfill. These expenditures reduced the resources available to focus on priority debris mission and other tasks.

Based on the never-finalized NISTAC report, FEMA instructed the Corps to limit the amount of debris sent to Gentilly Landfill on a daily basis to 5,000 cubic yards per day, which resulted in a substantial reduction from daily intake at the facility. Reduction of the amount of debris sent to Gentilly Landfill potentially had the impact of increasing time, distance, and expense for disposal.

5.6 FEMA Inconsistency

On the whole, LDEQ's working relationship with FEMA was generally productive. However, too often, our time and resources were wasted because of inconsistent interpretations, decisions, and directions from FEMA. This problem was compounded by frequent turnover of FEMA personnel and inadequate documentation/records of decisions.

5.7 Damage and Needs Assessment for Water and Wastewater Infrastructure

Although LDEQ has no direct responsibility for damage/needs assessment for wastewater and drinking water infrastructure, we do have responsibility for wastewater discharges and protection of drinking water sources. When we became involved in discussions related to needs assessment and recovery of the wastewater and drinking water infrastructures, we became aware that numerous organizations were conducting damage and needs assessments with little consistency in assumptions or methods. Cost estimates being prepared for replacement or repair of wastewater collection and treatment varied widely. Our agency then volunteered to try to rectify the situation and bring more accuracy and consistency to the cost estimates.

5.8 Inadequate Training/Familiarity with the National Response Plan (NRP), National Incident Management System (NIMS), and state Emergency Operations Plan (EOP).

Although not considered a major impediment, it would have been helpful to have had all managers and response staffs at affected local, state, and federal agencies adequately trained in NRP, NIMS, and the state's EOP. Pockets within each agency had received some training, but agency managers and field directors had to pick up the national incident management concepts on the fly. LDEQ now has required all emergency response personnel and the top three tiers of agency management to complete the NIMS training.

6.0 RECOMMENDATIONS (in no particular order)

6.1 EPA, in consultation with state agencies and appropriate federal agencies, should develop a national plan or guidelines that provide for environmental regulatory flexibility and debris management necessary to respond to emergencies. At a minimum, this plan should provide for a process to expeditiously obtain and provide authorization of activities necessary to respond to the emergency that would normally require a permit from the state environmental agency or the EPA. Even more useful would be a plan that includes agreed processes, tools, methods, guidelines, etc. This would require all affected agencies reaching consensus together before the disaster occurs.

6.2 The Unified Command/Incident Management Team organization and operations were, in our opinion, extraordinarily successful in integration and collaboration of federal, state, and local agencies with responsibilities for response to environmental emergencies. The structure and functioning of the organization should be reviewed for consideration as a model to be employed in future disaster responses.

6.3 Managers in all federal, state, and local agencies bearing responsibilities for directing emergency response and recovery efforts following major disasters should be trained in the National Incident Management System. Periodic training updates should also be required, which can easily be accomplished through computer-based training.

6.4 The federal government, through appropriate agencies, should support, maintain, and strategically pre-position remote-sensing assets for immediate reconnaissance and damage and threat assessment for environmental emergencies following major disasters. We have previously described the value of such assets (e.g. satellite imagery, high-resolution aerial photography, EPA ASPECT aircraft, HAWK mounted helicopters, and DOE radiation detecting aircraft) to our responses to Hurricanes Katrina and Rita.

6.5 Inaccurate and misleading information and sensationalized media coverage can be expected in any major disaster. The best antidote for this problem is getting accurate, credible information out to the public at the very earliest time. Federal, state, and local agencies should develop and implement procedures for expeditious environmental sampling, analysis, and reporting. This should also include established data collection protocols, data standards, and data flow. All agencies should sharpen their skills on environmental risk assessment and communication to the lay public.

6.6 The federal government should resolve the blurring of debris management responsibilities between FEMA, EPA, and state environmental and public health agencies. It is our strong opinion that FEMA should rely upon and respect the decisions of the agencies entrusted with environmental protection at the federal and state levels. Considerable time, effort, and taxpayer money were needlessly expended by FEMA's excursion into environmental decision-making for debris management.

6.7 FEMA operations should be reviewed to cure problems of inconsistency and poor documentation of decisions.

6.8 The federal government should assure and support seamless and robust communication capabilities for all federal, state, and local government agencies charged with responding to disasters.

6.9 FEMA should agree to fund pilot projects scoped and requested by EPA and LDEQ to determine if grinding and air curtain incineration of construction and demolition debris can be added to the toolbox of debris management options for emergency response and recovery. If results are favorable, these can become options for waste volume reduction in certain circumstances. If unfavorable, the question of utility has been answered and this/these options can be excluded from available options.

6.10 Several environmental statutes (especially the Clean Water Act and National Emissions Standards for Hazardous Air Pollutants [NESHAPS – asbestos]) should be reviewed and amended to provide for intelligent and protective regulatory flexibility during response and recovery following major disasters. It is our opinion that EPA enforcement discretion and no action assurance (NAA) letters are not the best answer to challenges brought by large disasters. In our written testimony, we discuss some of the emergency needs and regulatory flexibility challenges we faced in the aftermath of the storms.

6.11 The Stafford Act should be revisited to allow greater flexibility in funding for repairs/replacement of damaged infrastructure. Our understanding is that funding for substantially damaged structures such as wastewater treatment plants and collection systems can only be used to replace the damaged structures to what they were prior to the storm. In some instances, it would make more sense to allow regionalization, or allow replacement with new, perhaps less costly technologies/alternatives and also consider potential population redistributions following the disasters.

6.12 Local governments and state environmental agencies should be encouraged to review and identify potential waste management sites in planning for future disasters. LDEQ had to quickly identify, conduct environmental reviews, and clear with local governments over 400 sites for debris management following Hurricanes Katrina and Rita. We have now set about establishing and approving sites throughout the state in advance of future disasters such as hurricanes, tornadoes, floods, and ice storms. This was a consensus recommendation at the recent EPA-sponsored Workshop on Waste Management Options in Natural Disasters held March 27-29 in Baton Rouge. This planning should include consideration of special issues such as the deterrence and response to illegal dumping. Further consideration should be given to accommodating regional issues such as the quarantine for Formosan termites in Louisiana.

6.13 Current debris management procedures for storm-generated debris provide estimates only of debris subject to Corps (or local government) removal/disposal and FEMA reimbursement. For purposes of strategic management of landfill capacities and disposal, it

would be helpful to also have estimates of private and commercial debris quantities to be dealt with as well.

6.14 LDEQ suggests that the federal government look into a means of acquiring information from bulk carriers (e.g. rail cars, barges, tanker trucks) on locations of large quantities of hazardous materials, where possible, in advance of major natural disasters such as hurricanes and floods. LDEQ worked with Louisiana State Police and stakeholders to promulgate rules requiring the provision of such information whenever a declaration of emergency is issued.

6.15 Comprehensive guidance should be prepared for those having to estimate costs for FEMA reimbursements for replacement or repair of wastewater collection and treatment systems, as well as drinking water treatment and distribution systems for water and wastewater damaged by a major disaster.

7.0 FOLLOW-UP

Details for observations made in this document can generally be found in our written testimony and supporting exhibits provided to the Committee. However, LDEQ would be happy to provide additional information, if desired, or answer any questions the Committee might have related to information in the testimony or this document.